

Farms and Rivers: Balancing between Food Production and the Environment

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Overview

1. Why a water economist?
2. Water as a multi-dimensional good
3. Supply, demand and climate change
4. Agricultural water use
5. Environmental water use
6. Politics and economics
7. Question & Answer

Download *this* PDF at <http://tinyurl.com/awra-zetland3>

But wait! More in my (free) book and calendar

This talk is based on Chapters 5 & 10

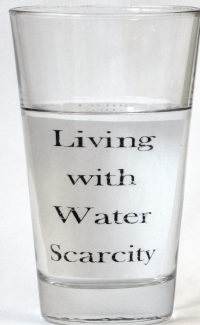
Download the PDFs at
www.livingwithwaterscarcity.com and
www.watersmartscalendar.com

2015 Water Smarts Calendar



...because every day is a water day.

David Zetland



Water as a complex good

Private water is excludable and rival

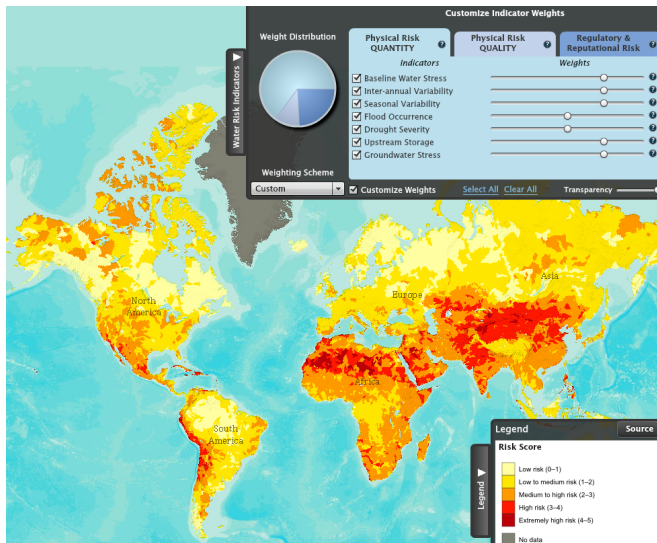
Common pool water is non-excludable and rival

Irrigation water goes to a farmer who uses some of it

Environmental water that benefits everyone can be depleted or contaminated

Bottom Line: We cannot live without taking some water from the environment, and we cannot live if we take it all. We need to find a balance, but people will disagree on that.

Water stress is causing problems



Source: <http://www.wri.org/our-work/project/aqueduct>

<http://tinyurl.com/awra-zetland3>

Water stress: causes and adverse consequences

Rising demand: More people consuming more stuff with more embedded water (e.g., meat)

Falling supply: “Flashier” water cycle, more contamination, and diminishing groundwater reserves

Stronger spillovers: Trade (export of virtual water) magnifies the impacts of local governance failure

Stress leads to economic and political disruption when...

Inertia: Existing institutions do not respond to stress

Ignorance: Water values are unknown, untested and unreconciled

Misdirection: Markets miss social values and politics misses private values

Policy cliché: Use the right tool for the job

When and how do we use markets?

1. There's a social cost when water goes to the wrong *uses*
2. There's a economic cost when water goes to the wrong *users*
3. Markets can allocate scarce private water by reconciling values
 - ▶ Value depends on the time, location and purpose of use
 - ▶ Prices reveal values from unexpected places
 - ▶ Value per unit rises with scarcity (diamond-water paradox)
 - ▶ Farmers will always be able to buy *some* water

Water markets work fine in Australia (endless studies), but what how do you start markets among “unwilling sellers”?

The all-in-auction

Start: Rights or claims $>$ water (weather or regulation)

Goal: Move water to highest value (=efficient)

Means: Markets match S and D, but what about. . .

- ▶ Farmers who should show up but don't ("participation effect") and/or
- ▶ Sellers who want too much ("endowment effect")?

Solution: Auction *all* water but let owners buy "for free"¹

Benefit: Extra liquidity creates extra (private=social) value

OK demo: <https://www.youtube.com/watch?v=MANM7EcTYuE>

¹Paper: http://www.kysq.org/pubs/AiA_Final.pdf

<http://tinyurl.com/awra-zetland3>

Environmental water

1. There's a cost to taking water from the environment
2. That cost affects all of us but the benefits go to some of us
3. "Correct" environmental flows (and groundwater reserves!) should be set in a political-social process, based on *science*

Scientific bias? I wrote (p 90):

"Acceptable" levels should... be set by scientists who understand the connections between flows and healthy ecosystems. Scientists may be vulnerable to the bias of reserving too much water for nature. That means we should make changes if their recommendations lead to outcomes that over- or undershoot the community's ecosystem targets. These adjustments will add or subtract water available for private uses, but a two-step allocation (reserve environmental flows before allocating remaining waters among human uses) is much easier to manage than balancing between "co-equal goals."

First politics, then economics

- ▶ Take care of society (survival)
- ▶ Then allocate economic water to highest and best use
- ▶ This probably means paying farmers for their rights
- ▶ The system should be flexible in volumes and uses
- ▶ Don't forget tailwater! (AWRA 20 Aug here:
<http://kysq.org/talks.html>)

Blog: aguanomics.com

Book: livingwithwaterscarcity.com ← It's free!!

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Now let's do the Q&A!